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(12) (19) (CA) **Demande-Application**

(21) (A1) **2,291,043**
(86) 1998/05/19
(87) 1998/12/03

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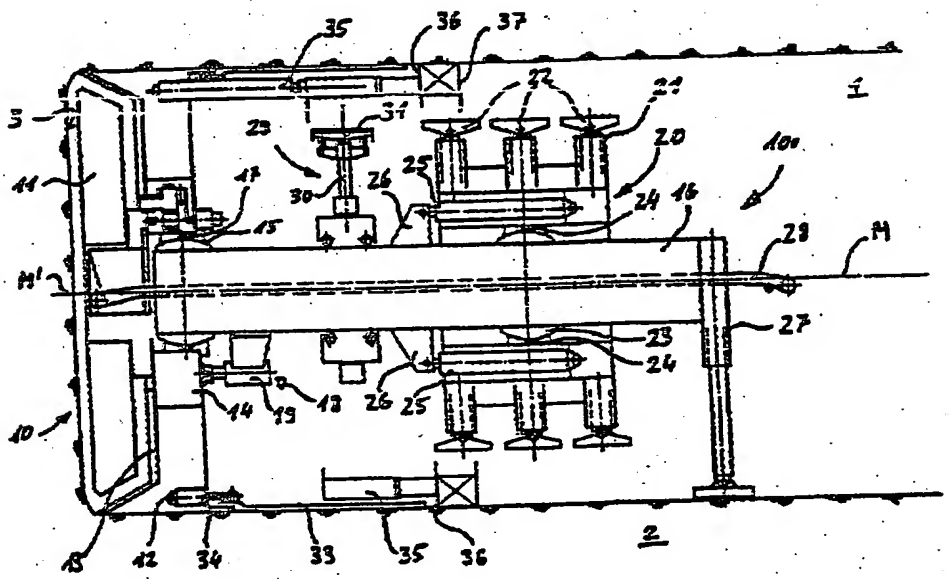
(51) Int.Cl.[7] E21D 9/10, E21D 9/06
(30) 1997/05/27 (197 22 000.2) DE

(54) **MACHINE A PERCER DES TUNNELS**
(54) **TUNNEL-BORING MACHINE**



(57) L'invention concerne une machine percer des tunnels (100) servant à creuser une galerie, au choix en mode de creusement en tranchées ou en mode de travail au bouclier. Cette machine comprend une queue de bouclier (33) raccordée à une tête de forage (10) et recouvrant de manière facultative la paroi de forage sur une longueur limitée, un dispositif de haubanage pouvant éventuellement être fixé dans la galerie, un générateur d'avancement (25) pouvant être mis en marche de manière facultative, qui s'appuie d'une part sur le dispositif de haubanage (20) et agit d'autre part sur la tête de forage (10), ainsi qu'un générateur d'énergie (35)

(57) The invention relates to a tunnel-boring machine (100) for driving a tunnel bore optionally in open or shielded mode. The inventive tunnel-boring machine comprises a shield tail (33), said shield tail being connected to a bore head (10) and optionally covering the bore walling over a set length, a bracing device which can optionally be fixed in the tunnel bore, an advancement device (25) which can be operated optionally, said advancement device resting on said bracing device (25) and acting on the bore head (10), and a device for generating power (35) which has a variable length, rests on a tubbing (32) and acts on the bore head

Patent Claims

1. Tunnel rock drill (100) for driving a tunnel bore optionally in open or shielded mode,

comprising a drill head (10),

comprising a shield tail (33), which is connected to the drill head (10) and which covers optionally at least in part the bore wall over a defined length,

comprising a bracing device (20), which can be optionally fixed in the tunnel bore and which serves to divert the reaction forces generated by the boring process,

comprising at least one optionally activatable advancement device (25), which, on the one hand, rests on the bracing device (20) and, on the other hand, acts on the drill head (10) in order to drive the drill head (10) with advancing forces in the open mode, and

comprising at least one optionally activatable force generator (35), which has a variable length and which, on the one hand, rests on a tubbing support (32) or an abutment (37) for the tubbing support (32) and, on the other hand, acts on the drill head (10) in order to drive the drill head (10) with advancement forces in shielded mode, characterized by

an inner kelly (16), which can be moved in the direction of boring in relation to the bracing device (20) and whose breast-sided end bears the drill head, and by hinging the at least one advancement device (25) to the inner kelly.

2. Tunnel rock drill, as claimed in claim 1, characterized in that the shield tail (33) is designed in such a manner that the bore wall area covered by the same can be exposed.

3. Tunnel rock drill, as claimed in claim 1 or 2, characterized in that the inner kelly (16) is mounted in the bracing device (20) so as to slide longitudinally, but is rotationally rigid, and that the drill head (10) can be rotated at the inner kelly (16).

4. Tunnel rock drill, as claimed in claim 3, characterized in that there is a drive block (14), with which the drill head (10) can be set into rotation, between the drill head (10) and the inner kelly (16) and which is designed in such a manner that the drive reaction moments can be introduced into the inner kelly (16).

5. Tunnel rock drill, as claimed in any one of the claims 1 to 4, characterized in that the drill head (10) is hinged to the inner kelly (16) in such a manner that in operation the drill head's (10) axis of rotation (M') can be swivelled in relation to the longitudinal axis (M) of the inner kelly.

6. Tunnel rock drill, as claimed in claim 5, characterized in that the inner kelly (16) is mounted in the bracing device (20) so as to be swivellable around an arbitrary axis, perpendicular to its longitudinal axis.

7. Tunnel rock drill, as claimed in claim 5 or 6, characterized in that there is at least one controller (18), which has a variable length and which is connected, on the one hand, to a part of the drill head (10) or the drive block (14) that is rotationally rigid and is connected, on the other hand, to the inner kelly (16).

8. Tunnel rock drill, as claimed in claim 7, characterized in that the advancement reaction forces can be transferred from the drill head (10) to the inner kelly (16) over the controller (18).

9. Tunnel rock drill, as claimed in any one of the claims 1 to 8, characterized in that the controller (18), the advancement device (25) and/or the force generator (35) are formed by hydraulicly operated piston-cylinder units.

10. Tunnel rock drill, as claimed in any one of the claims 1 to 9, characterized in that the articulated connections between drill head (10) and inner kelly (16) and / or between inner kelly (16) and bracing device (20) are formed by ball joints.

11. Tunnel rock drill, as claimed in any one of the claims 1 to 10, characterized in that the drill head (10) is driven electrically and / or hydraulicly.

12. Tunnel rock drill, as claimed in any one of the claims 1 to 11, characterized by means for simultaneous installation of bore supports and / or boardings during the boring operation.

13. Tunnel rock drill, as claimed in claim 12, characterized in that the means are arranged between the drill head and the bracing device (20).

14. Tunnel rock drill, as claimed in any one of the claims 1 to 13, characterized in that the drill cuttings, detached from the breast, are carried away by means of a drill cuttings conveyor (28), which runs through the inner kelly.

15. Process for driving a tunnel bore, during which process the work varies from open to shielded mode, depending on the nature of the rock surrounding the tunnel bore; wherein in open mode the advancement forces are transferred from a bracing device over an inner kelly, which bears the drill head on its breast-sided end, and wherein in shielded mode the advancement forces are introduced in the drill head over at least one force generator, acting between a tubbing support or an abutment for the tubbing support and the drill head.

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